IDAHO
DEPARTMENT OF FISH & GAME

Jerry M. Conley, Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-73-R-4

Fishery Research

SUBPROJECT II: SALMON AND STEELHEAD INVESTIGATIONS
Study II: Salmon Spawning Ground Surveys

Period Covered: 1 March 1981 to 28 February 1982

by

Herbert A. Pollard, II, Anadromous Fisheries Coordinator
Ronald L. Lindland, Regional Fishery Biologist
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September, 1982

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JOB PERFORMANCE REPORT

State of Idaho	Name: SALMON AND STEELHEAD INVESTIGATIONS
Project No. F-73-R-4	
	Title: Salmon Spawning Ground
Study II	Surveys

Period Covered: 1 March 1981 to 28 February 1982

ABSTRACT

Each year regional fishery biologists survey major chinook salmon spawning areas in their respective regions to count the number of redds constructed in trend count areas and to obtain age and sex composition data. The data are made available for trend analysis, management, and research use.

Redd counts on the Salmon River in 1981 were nearly four times higher than the record low counts in 1980, but still were only one-half the five-year average count. On the Clearwater River, counts were slightly above the five-year average due to a good return in the South Fork Drainage, particularly Red River.

Redd counts, sex and age data for 1981 are presented in a series of attached tables and maps.

In 1981, spawning trend counts for sockeye salmon at Redfish Lake were established.

Authors:

Herbert A. Pollard, II, Anadromous Fisheries Coordinator Ronald L. Lindland, Regional Fishery Biologist
Kent W. Ball, Regional Fishery Biologist
Will W. Reid, Regional Fishery Manager

RECOMMENDATIONS

Chinook redd count surveys, age and sex composition data collections should be continued to provide management data.

Sockeye salmon surveys should be conducted on Redfish Lake and Fishhook Creek each year between 5 and 10 October.

OBJECTIVES

To obtain an index to spawning escapement by counting chinook salmon redds in established trend areas.

To obtain age and sex composition data of the chinook spawning population.

To establish an index of sockeye salmon spawning in Redfish Lake and Fishhook Creek.

TECHNIQUES USED

Redd counts are made from low flying, fixed-wing aircraft, helicopter, or on-foot, depending on which technique is best suited for a particular stream. Redds are counted when preliminary observations indicate that spawning is over and before redds become obscure from algae and silt.

Carcass surveys ideally are made three times during post-spawning die-off to eliminate bias in sex ratios noted early and late in the season.

Chinook redd counts are included for selected tributaries of the Clearwater River to assist evaluation of reintroduction efforts.

Sockeye salmon counts are made from a small boat on Redfish Lake and on foot in Fishhook Creek. The trend area on Redfish Lake is about 0.8 km of shoal on the east shore of the lake south of Sandy Beach. The trend area on Fishhook Creek is from the mouth up to the nature trail footbridge.

FINDINGS

Redd count surveys and sex and age composition data collections were made during the late summer of 1981. These data are summarized in attached tables and maps.

Salmon River Drainage

Redd counts in 1981 exceeded 1979 and 1980 counts, but were below the five-year average throughout the drainage. The 1981 total of 1,248 redds is nearly four-times the 1980 count, but only one-half the average for the previous five years. Table 1 compares 1981 counts with those of the preceeding five years.

Clearwater Drainage

Spring chinook redd counts were up in most trend areas of the Clearwater River drainage in 1981. The most significant increases occurred in Red River and Brushy Fork Creek. Table 4 summarizes redd counts in the Clearwater drainage for 1981. Table 2 compares 1981 counts with annual counts since 1973.

Lochsa Drainage

Aerial counts on the Lochsa drainage revealed totals of 69 redds in Crooked Fork Creek from its mouth to Fox Creek, and 25 redds in Brushy Fork Creek from its mouth to the Low Gap Bridge (Table 4). The 27 redds counted in the ground count section of Crooked Fork Creek amounts to 93% of the previous five-year (1976-1980) average. The Brushy Fork count was 1.7 times the five-year average of 15 redds (Table 2). Sunny weather and extremely low flows made for excellent counting conditions during the 1981 Lochsa redd counts.

Selway Drainage

A total of 65 redds were counted in the Selway trend areas in 1981. Although this is an 18% increase over the 55 redds counted in 1980, it still amounts to only 68% of the previous five-year average. Weather was partly cloudy during the Selway flight, but observation conditions were good.

South Fork Drainage

Redd counts in Red River were more than double the 1980 count, and four-times the 1979 count. The 80 redds counted this year were more than double the previous five-year average (Table 2). Of the 19 salmon carcasses recovered in Red River this fall, two were tagged at Red River Pond in 1978 (1979 outmigration). One was recovered 6.6 miles above the pond, and the other about 400 yards above the pond (Table 3).

Newsome Creek, Crooked River, and American River were not so encouraging. Both Newsome Creek and Crooked River counts were considerably lower than 1980, and amounted to only 43% and 17% of their respective five-year averages (Table 2). Crooked River redd counts have declined drastically in recent years, after reaching a peak of 50 redds in 1977. No smolt releases have been made into Crooked River since 1976, and the hatching channel was abandoned in 1978 when our lease expired. The American River trend area was not established until 1980, when 7 redds were counted; 12 were counted this year (Table 2).

Observation conditions were excellent during the South Fork spawning ground flight.

Sockeye Spawning Survey

We looked for sockeye salmon and redds once each week between 15 September and 21 October to identify the peak of spawning activity (Table 8). We were unable to count redds due to wave action, but we observed the maximum number of sockeye (26) on 6 October. No sockeye salmon or redds were found in Fishhook Creek.

Table 1. Salmon River drainage chinook salmon redd counts, 1981.

Streams	1976	1977	1978	1979	1980	5-year average	1981
Spring chinook							
Alturas Lake Creek	16	85	303	29	7	88	4
Upper Salmon River	378	698	1707	205	47	607	363
Upper Valley Creek	nc	18	141	25	6	48	2
Upper Yankee Fork	40	6	33	18	0	19	16
Upper East Fork	75	168	841	57	6	229	76
Herd Creek	27	6	26	2	0	12	9
Marsh Cr. Drainage	48	98	270	47	9	94	63
Lemhi River	241	474	796	154	47	342	126
North Fork Salmon R.	6	31	29	nc	nc	22	nc
Bear Valley Creek	76	129	184	69	15	95	60
Elk Creek	61	86	208	49	8	82	23
Sulphur Creek	14	5	64	15	2	20	7
Upper Big Creek	22	9	95	15	4	29	22
Subtotal	1,004	1,813	4,697	685	151	1,637	771
Summer chinook							
Lower Salmon River	44	94	349	nc	11	125	75
Lower Valley Creek	43	63	219	15	4	69	17
Lower East Fork	39	136	nc	33	0	52	43
Loon Creek	31	62	29	nc	9	33	30
South Fork Salmon R.	241	226	251	115	116	190	126
Johnson Creek	68	81	113	36	24	64	45
Secesh R.-Lake Cr.	17	27	91	20	20	35	53
Subtotal	483	689	1,052	219	184	568	389
Unclassified Spawners							
Camas Creek	61	84	148	15	17	65	65
Lower Yankee Fork	3	12	27	nc	0	11	4
West Fork Yankee Fork	11	37	98	13	2	32	19
Subtotal	75	133	273	28	19	108	88
Total	1,562	2,635	6,022	932	354	2,363	1,248

Table 2. Clearwater River Drainage Chinook Salmon Redd Counts, 1973-1981.

Streams	Method of Survey	Number of Redds counted in: 1973	1974	1975	1976	1977	1978	1979	1980	5-yr. Ave.	1981
Selway Drainage											
Selway River	Aerial	261	66	21	58	97	125	21	40	67	47
Bear Creek	Aerial	26	10	5	14	18	13	3	7	11	8
Running Creek	Aerial	21	4	0	3	2	6	0	1	2	*
White Cap Creek	Aerial	7	2	1	4	1	*	2	3	2	4
Moose Creek	Aerial	32	15	4	15	23	17	4	4	13	6
Sub total		347	97	31	94	141	161	30	55	95	65
Lochsa Drainage											
Crooked Fork	Ground	60	22	6	36	51	37	6	16	29	27
Brushy Fork	Aerial	*	6	4	13	15	25	12	10	15	25
Sub total		60	28	10	49	66	62	18	26	44	52
South Fork Drainage											
Newsome Creek	Ground	*	3	10	3	9	14	6	5	7	3
Crooked River	Ground	*	5	41	8	50	23	2	8	18	3
Red River	Aerial	*	12	20	15	50	52	20	38'	35	80'
American River	Aerial	*	*	*	*	*	*	*	7	-	12
Sub total		-	20	71	26	109	89	28	58	60	96
Total		407	145	112	169	316	312	76	135	199	213

*No survey
'New section added from Ditch Creek to Otterson Creek

Table 3. Lengths of summer chinook kelts measured in 1981 (fork length, inches)

Fork length, inches	Johnson Creek		So. Fk. Salmon		Secesh River		Lake Creek	
	Male	Female	Male	Female	Male	Female	Male	Female
17								
18	1							
19			1		1			
20								
21								
22								
23								
Subtotal	1	0	1	0	1	0	0	0
24								
25								
26								
27								
28	1							
29							1	2
30	1	1	2		2		1	1
31	1		1		1			2
Subtotal	3	1	3	0	3	0	2	5
32		1				2		
33								
34		2						
35		2		2				
36		2						
37								
38								
39								
40						1		
Subtotal	0	7	0	2	0	3	0	0
Total	4	8	4	2	4	3	2	5

Table 4. Spring Chinook Spawning Surveys in Clearwater River Drainage, 1981

Ground Counts

Date	Stream	Section	Redds	Live Fish	Dead Fish
8/27	Crooked Fork Creek	Rock Creek - Cliff Hole	27	27	4
9/3	Selway River	Magruder Crossing - Little Clearwater	18	14	0
9/8	Newsome Creek	Nugget Creek - Beaver Creek	3	0	0
9/8	Crooked River	Relief Creek - Upper End of Airport	3	0	2
9/9	Red River	Blanco Road - Moose Butte Bridge	13	18	0

Aerial Counts

Date	Stream	Section	Redds	Live Fish
8/31	Crooked Fork Creek	Mouth - Brushy Fork Creek	21	15
8/31	Crooked Fork Creek	Brushy Fork - Fox Creek	48	27
8/31	Brushy Fork Creek	Mouth - Bridge at Low Gap	25	11
9/4	Selway River	Thompson Flat - Magruder Ranger Station	10	6
9/4	Selway River	Magruder R.S. - Magruder Crossing	4	2
9/4	Selway River	Little Clearwater - White Cap Creek	6	4
9/4	Selway River	White Cap Creek - Running Creek	5	3
9/4	Selway River	Running Creek - Bear Creek	4	0
9/4	White Cap Creek	Mouth - Cooper's Flat	4	2
9/4	Bear Creek	Mouth - Cub Creek	8	5
9/4	Moose Creek	Mouth - 3 miles above Elbow Bend	6	4
9/10	Red River	Cole 66 Bridge - Red River Ranger Station	47	61
9/10	Red River	Ditch Creek - Otterson Creek	33	21
9/10	American River	Johnson Dredge-Manes Ranch	12	7
9/10	Newsome Creek	Mouth - Nugget Creek	4	2
9/10	Newsome Creek	Beaver Creek - Old Newsome	3	0
9/10	Crooked River	Narrows - Orogrande Lodge	9	6

Table 5. Summary of Spring Chinook Salmon Carcasses Collected on Red River, 1981.

Date Collected	Fork Length (in.)	Sex	Spawned Out	Marks	Location Collected
8/6	30	Male	No	Adipose Clip	7.5 miles above pond
8/18	32	Female	Yes		
8/18	36	Male	Yes		
8/18	30	Male	No		
9/1	28	Female	No		
9/1	28	Female	No		
9/1	28	Female	No		
9/1	35	Female	Yes		
9/1	28	Female	No		
9/1	26	Female	Yes		
9/1	25	Male	Yes	Adipose Clip	6.6 miles above pond
9/10	30	Male	Yes		
9/10	27	Female	Yes		
9/10	29	Female	Yes	Adipose Clip	200 yds above R.S.
9/10	30	Female	Yes		
9/10	28	Male	Yes		
9/10	30	Male	Yes		
9/10	32	Male	Yes		
9/10	29	Female	Yes		

Table 6. Length frequency distribution for spawned-out chinook salmon in stream areas believed to be used primarily by spring-run fish, 1981.

Fork length (in)	Lemhi River		Marsh Creek drainage		Salmon River (upper)		East Fork (upper)		Bear Valley Creek		Elk Creek		Sulphur Creek	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
17														
18														
19														
20														
21														
22						1								
23														
Subtotal	0	0	0	0	0	1	0	0	0	0	0	0	0	0
24					1	1								
25														
26	1				3						1			1
27		1		1	3			1			2			
28	1		1		11	5			1			1		
29	1				4	7			2		1	1		
30					2									
31					1	2								
Subtotal	3	1	1	1	25	15	0	1	3	0	4	2	0	1
32	1					1	1		1					
33	1		1		2	1	2		2	1				
34	1						1				1			
35			2		2	1		1	1					
36					1	1								
37					1		1							
38														
39														
40														
41						1								
Subtotal	3	0	3	0	6	5	5	1	4	1	1	0	0	1
Total	6	1	4	1	31	21	5	2	7	1	5	2	0	1

Table 7. Percent age composition, by sex, of spring chinook salmon found dead on spawning grounds in Idaho, 1981.

Stream and age group	Females	Males	Males and Females
Lemhi River			
Age group 3_2	--	--	--
Age group 4_2	50	100	57
Age group 5_2	50	--	43
	100	100	100
	(n=6)	(n=1)	(n=7)
Marsh Creek drainage			
Age group 3_2	--	--	--
Age group 4_2	25	100	40
Age group 5_2	75	--	60
	100	100	100
	(n=4)	(n=1)	(n=5)
Salmon River (upper)			
Age group 3_2	--	5	2
Age group 4_2	81	75	78
Age group 5_2	19	20	20
	100	100	100
	(n=31)	(n=20)	(n=51)
East Fork (upper)			
Age group 3_2	--	--	--
Age group 4_2	--	50	14
Age group 5_2	100	50	86
	100	100	100
	(n=5)	(n=2)	(n=7)

Table 8. Number of fish and redds counted in Redfish Lake and Fishhook Creek during sockeye salmon spawning surveys, 1981.

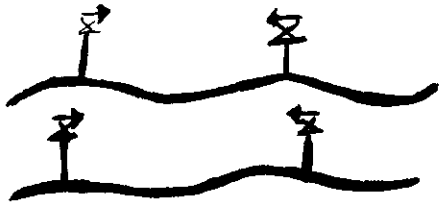
Date	Redfish Lake			Fishhook Creek		
	No. males	No. females	redds	No. males	No. females	redds
9/15	0	0	--*	0	0	0
9/22	0	2	--	0	0	0
9/29	5	2	--	0	0	0
10/6	21	5	--	0	0	0
10/13	14	5	--	0	0	0
10/21	0	0	--	0	0	0

*Unable to count redds due to wave action.

APPENDIX I. LEGEND

Ground Survey Sections

Aerial Survey Sections



Ground Redd Counts

Aerial Redd Counts

Aerial-Ground Check Areas

Aerial-Ground Check Area Count

Migratory Block

Road

Trail

Forest Service Stations

Landing Strip

Fence

Pack Bridge

Highway Bridge

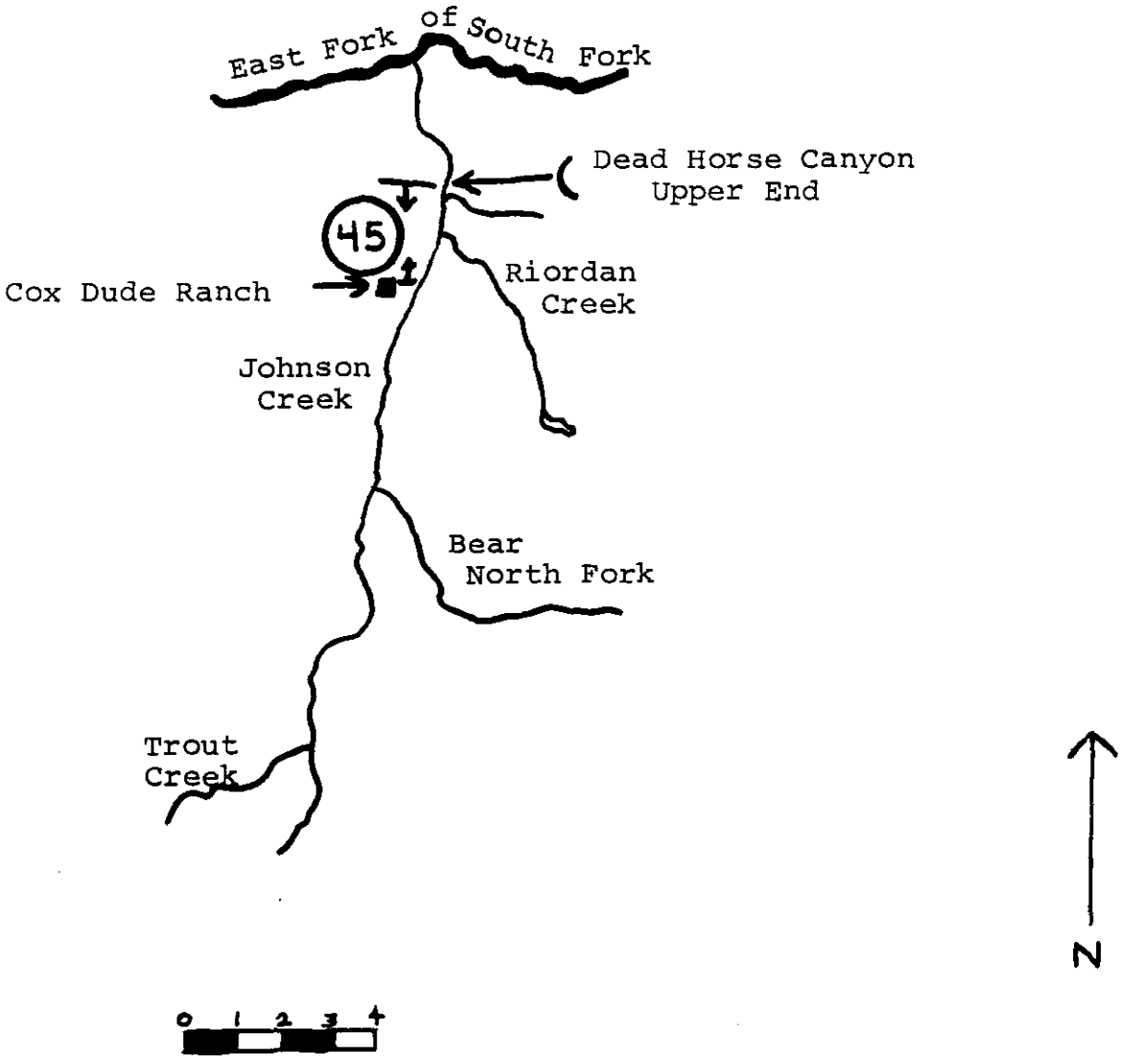
DRAINAGE E. F. of South Fork SURVEY DATE September 1, 1981

STREAM Johnson Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS Excellent OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: _____



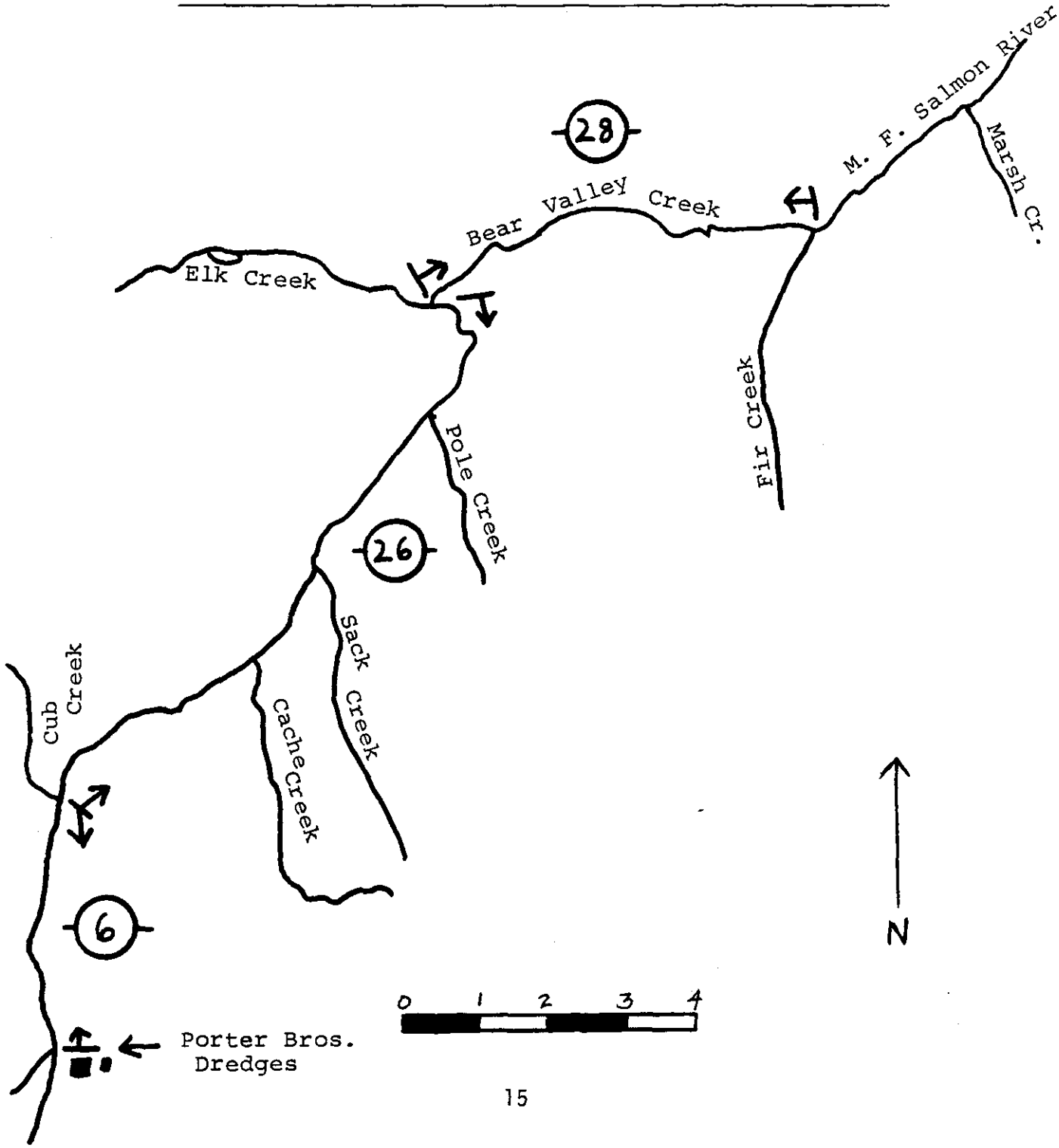
DRAINAGE M. F. Salmon River SURVEY DATE September 10, 1981

STREAM Bear Valley Creek MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS Poor OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: High winds made observation very difficult. A poor count.



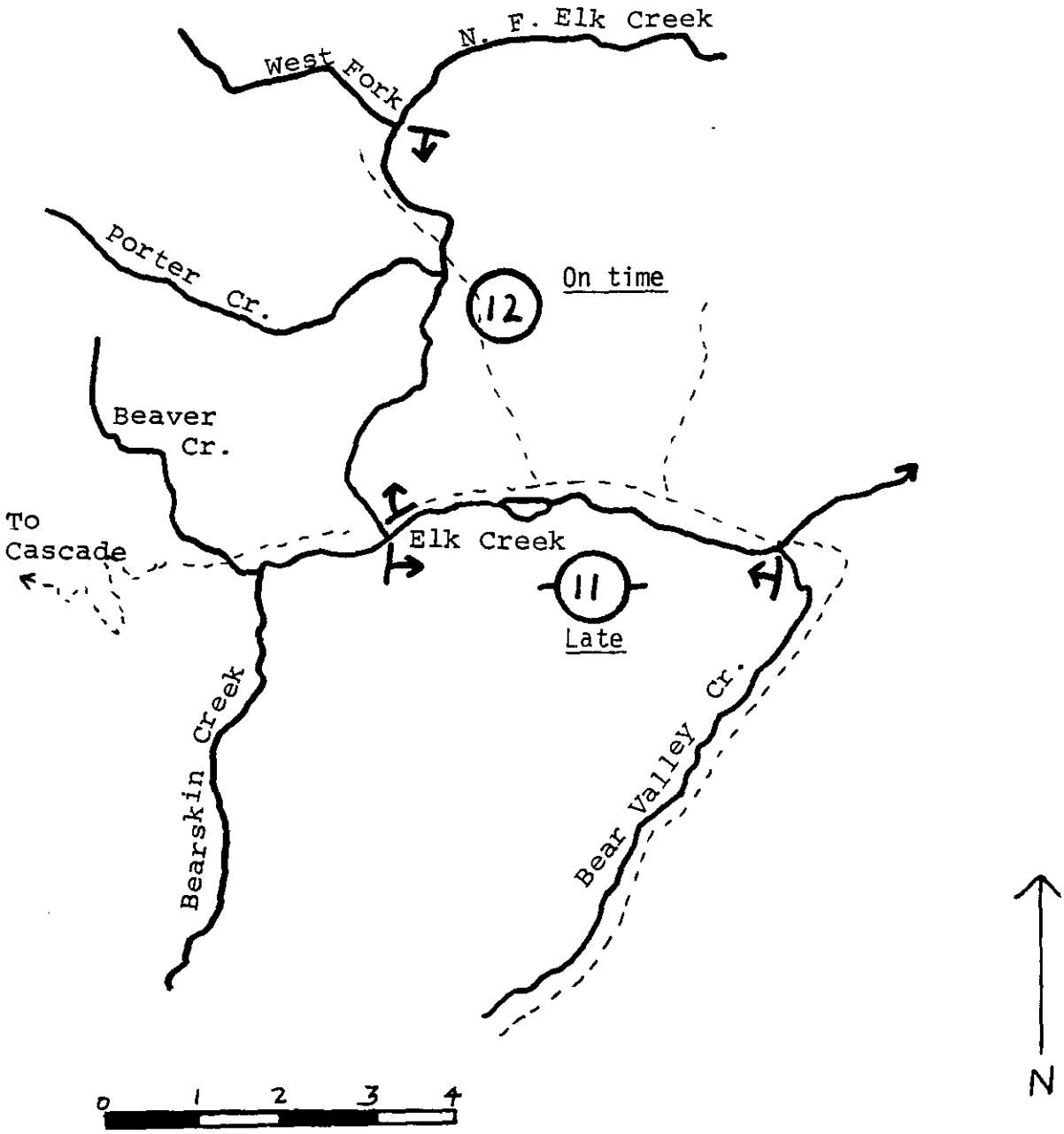
DRAINAGE M. F. Salmon River SURVEY DATE September 10, 1981

STREAM Elk Creek MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS Poor OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: High winds made observation difficult on lower Elk Creek.
Upper is a very good count.



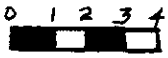
DRAINAGE M. F. Salmon River SURVEY DATE August 18, 1981

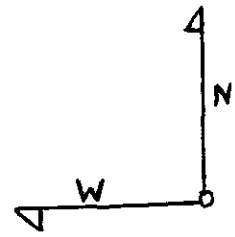
STREAM Sulphur Creek MAP SCALE 1/6" = 1 mile

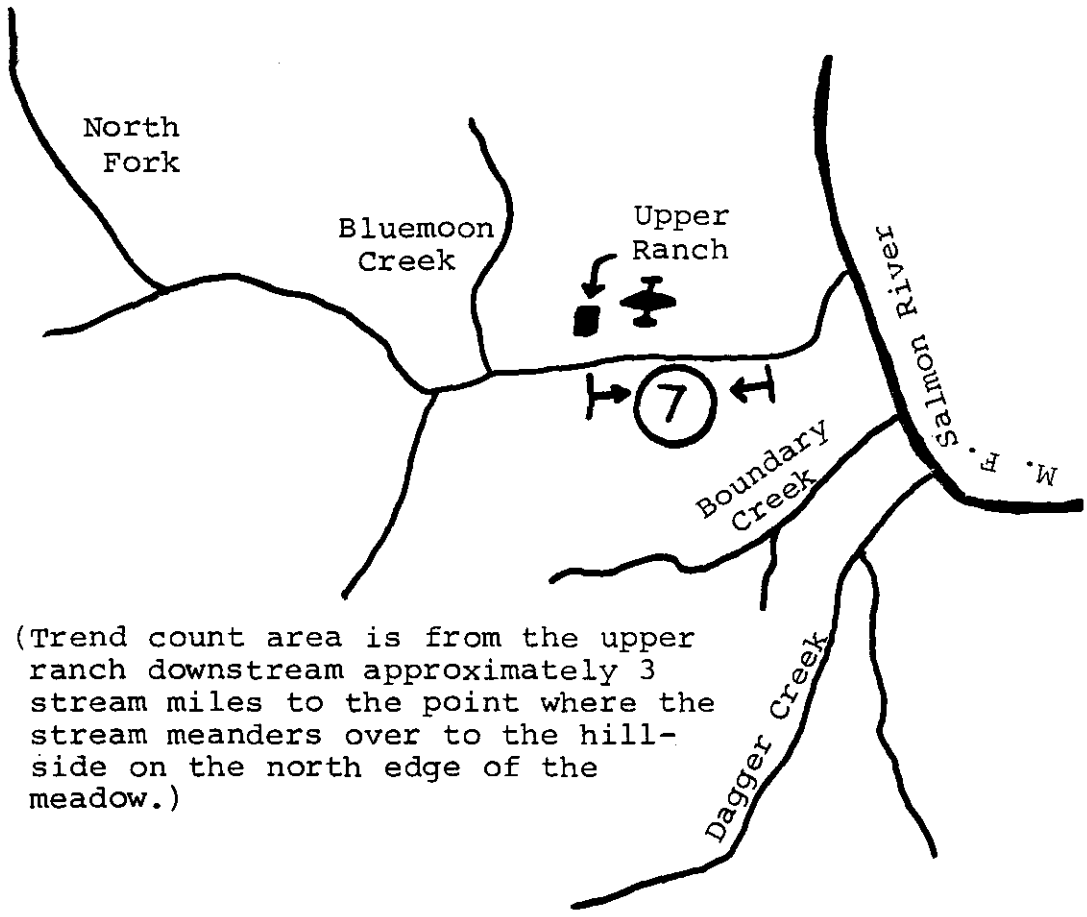
OBSERVATION CONDITIONS Good OBSERVER Anderson

TIMING: Early On Time Late (mark one)

REMARKS: _____







(Trend count area is from the upper ranch downstream approximately 3 stream miles to the point where the stream meanders over to the hillside on the north edge of the meadow.)

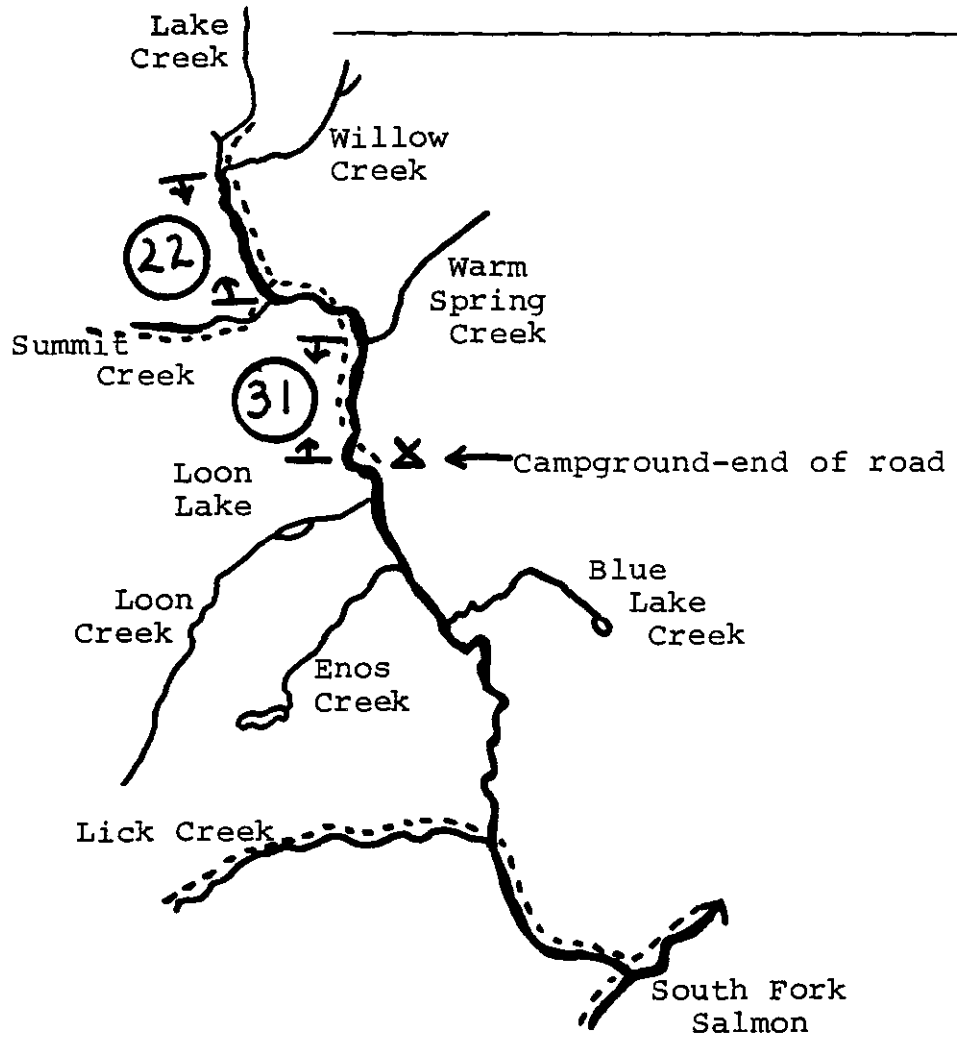
DRAINAGE S. F. Salmon River SURVEY DATE August 28, 1981

STREAM Secesh and Lake Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS Excellent OBSERVER Anderson

TIMING: Early On Time Late (mark one)

REMARKS: _____



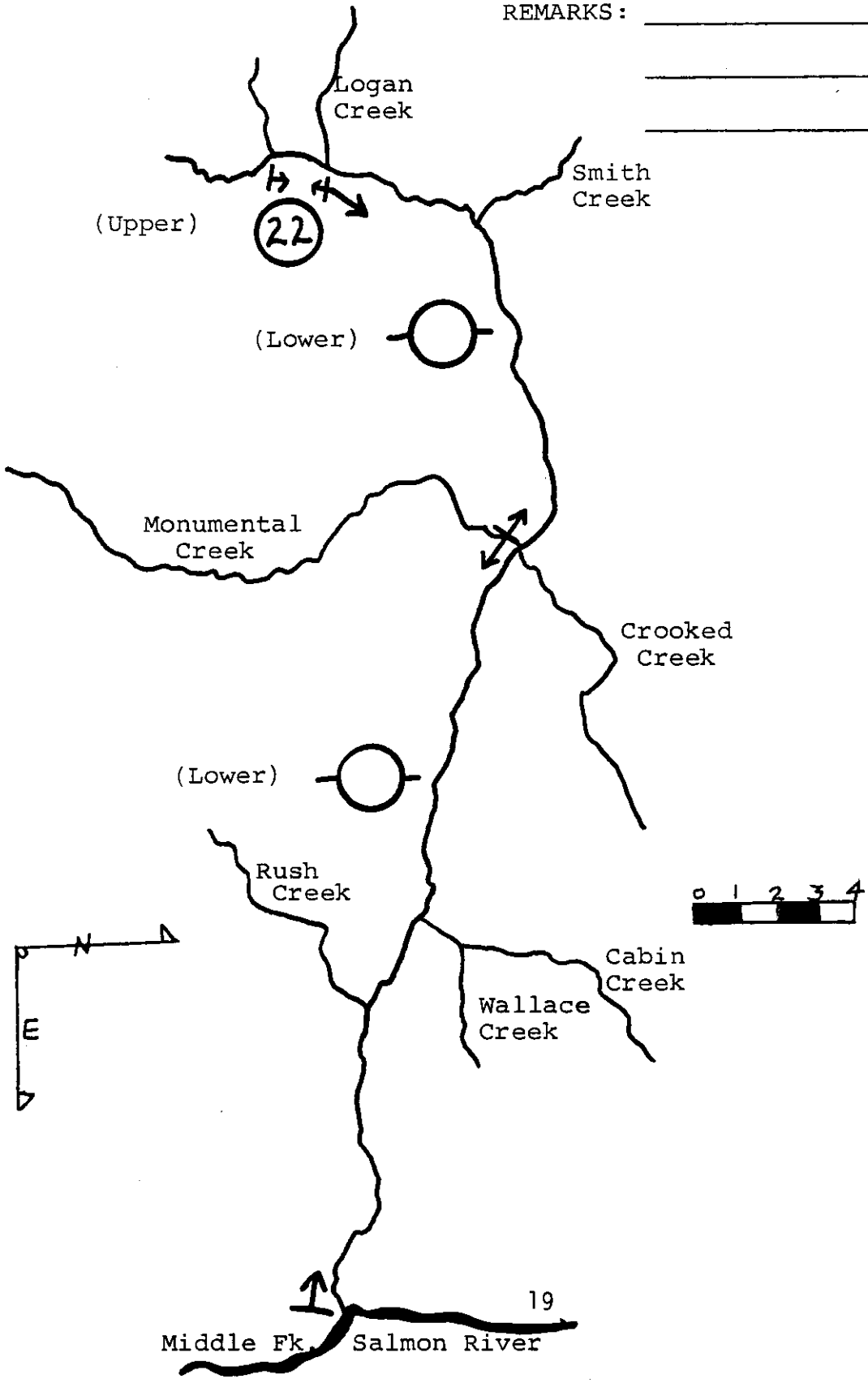
DRAINAGE M. F. Salmon River SURVEY DATE September 3, 1981

STREAM Big Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS Excellent OBSERVER Anderson

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE Salmon River

STREAM S. F. Salmon River

OBSERVATION CONDITIONS Excellent

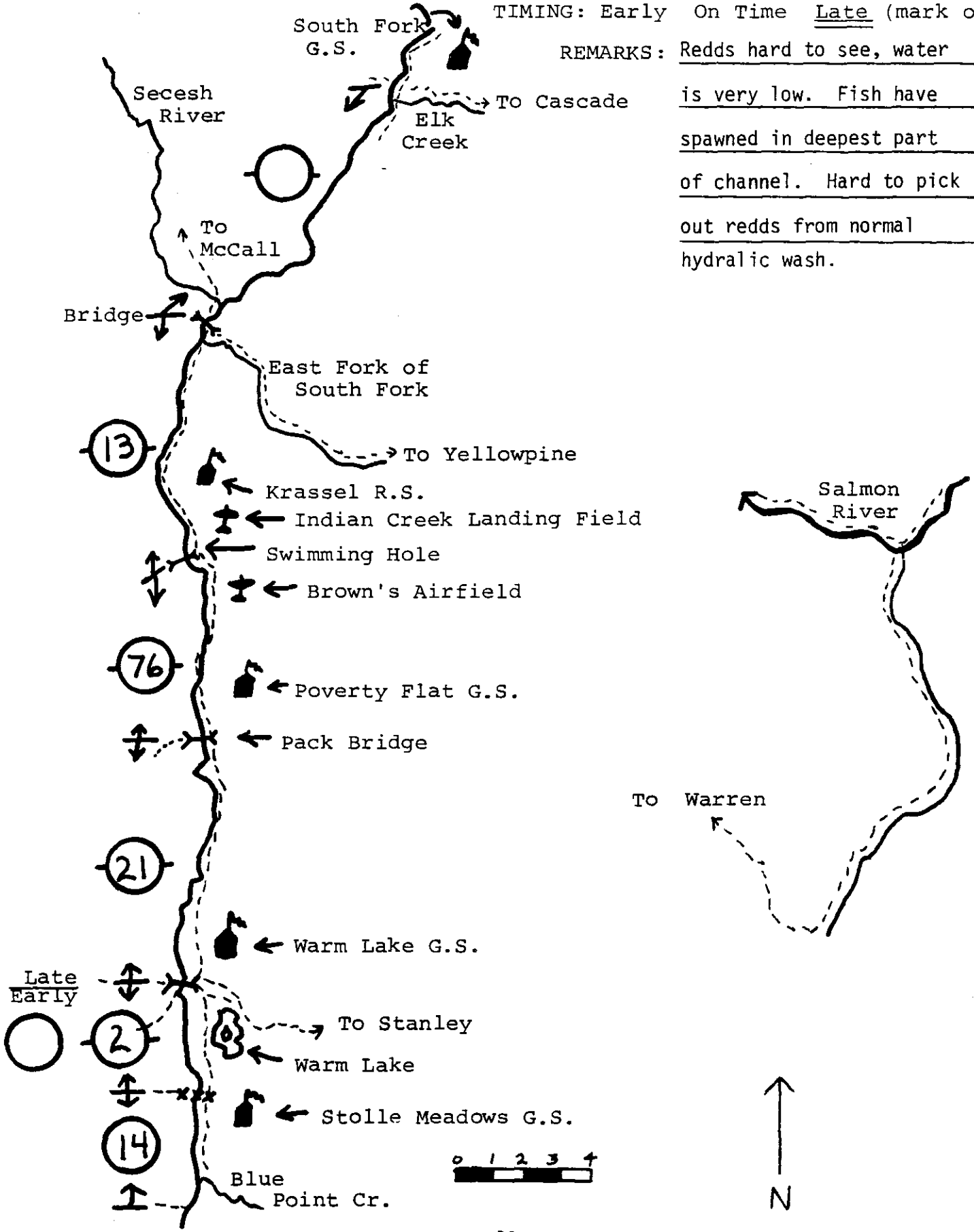
SURVEY DATE September 17, 1981

MAP SCALE 1/4" - 1 mile

OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: Redds hard to see, water is very low. Fish have spawned in deepest part of channel. Hard to pick out redds from normal hydralic wash.



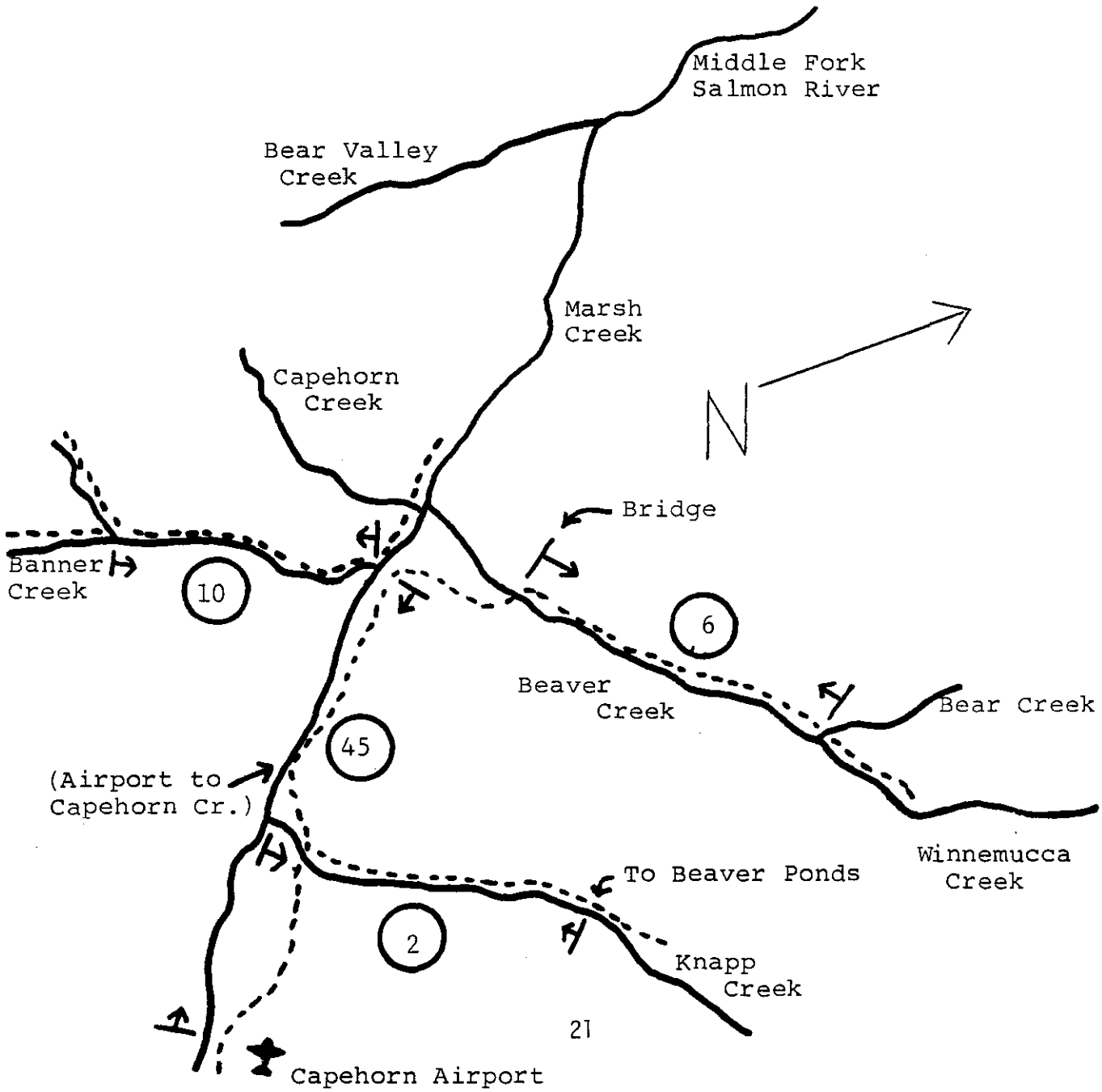
DRAINAGE M. F. Salmon River — SURVEY DATE Aug. 13, 14, 1981

STREAM Marsh, Beaver, Knapp, Capehorn Creeks — MAP SCALE 2/3" - 1 mile

OBSERVATION CONDITIONS Good — OBSERVER Ball, Somes, Heitz

TIMING: Early On Time Late (mark one)

REMARKS: _____



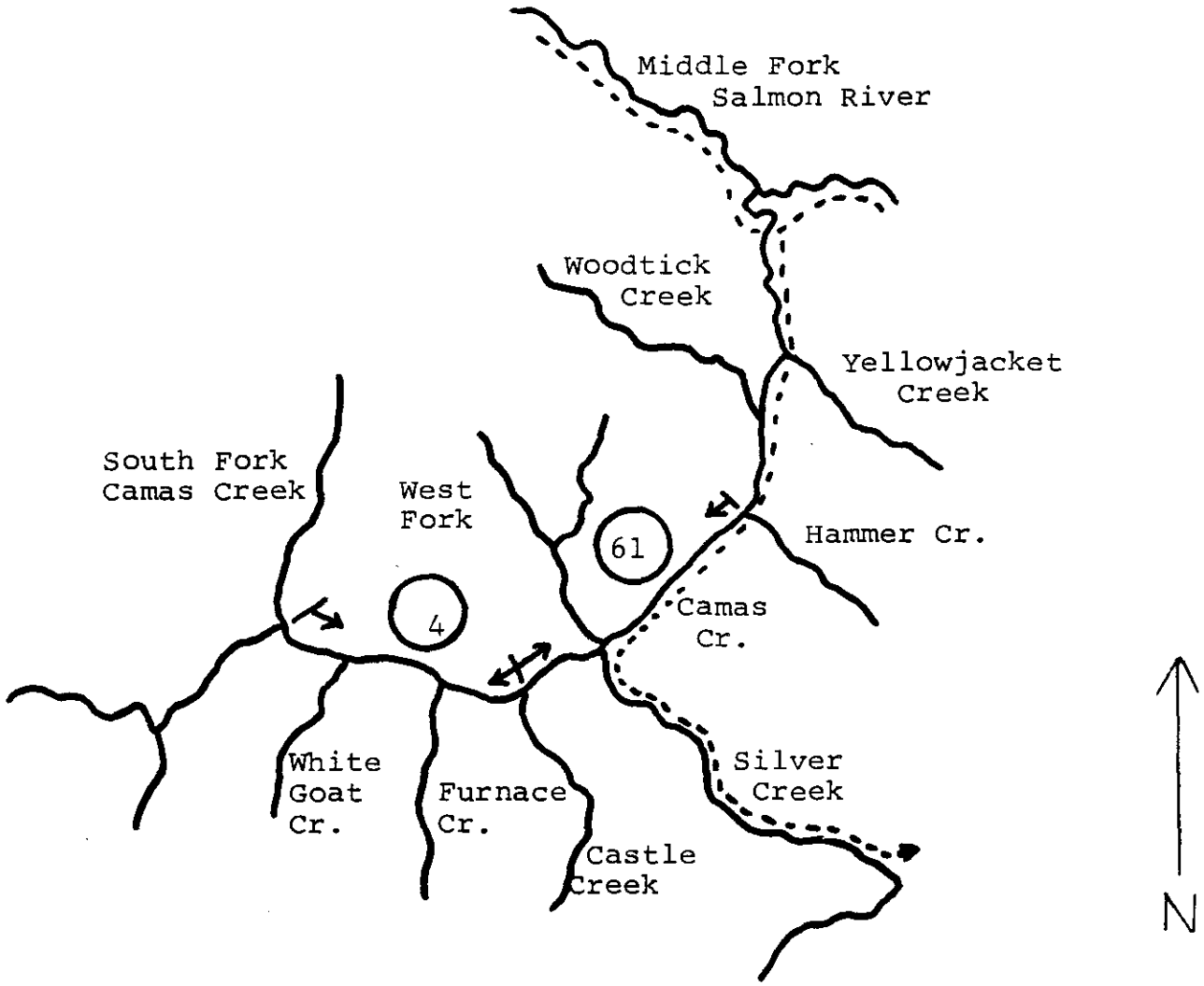
DRAINAGE M. F. Salmon River SURVEY DATE Aug 24, 31, 1981

STREAM Camas Creek MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Murnane

TIMING: Early On Time Late (mark one)

REMARKS: Upper section was counted by air.



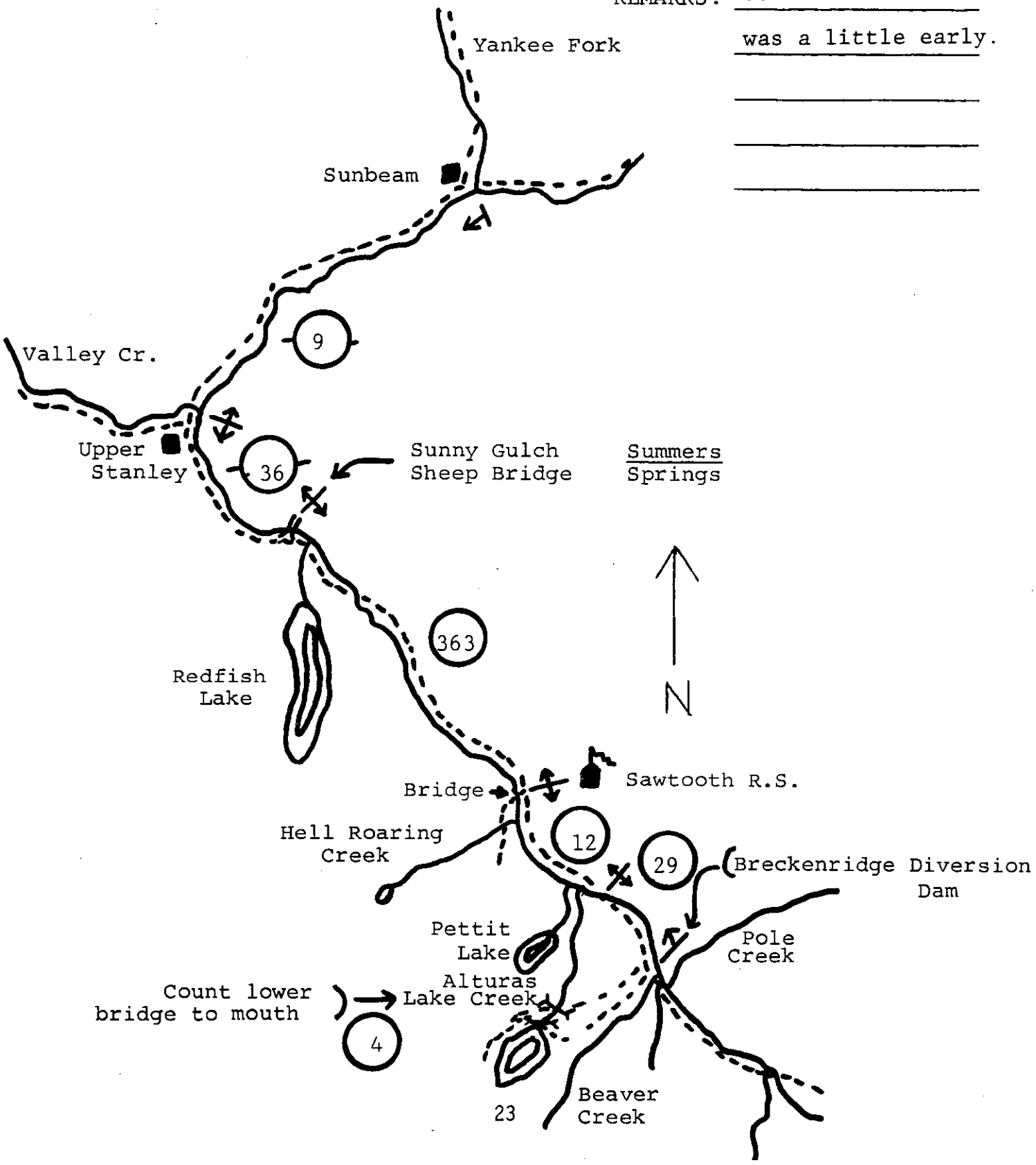
DRAINAGE Salmon River SURVEY DATE Aug. 20, Sept. 1, 2, 1981

STREAM Salmon River MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Law, Murnane

TIMING: Early On Time Late (mark one)

REMARKS: Summer section was a little early.



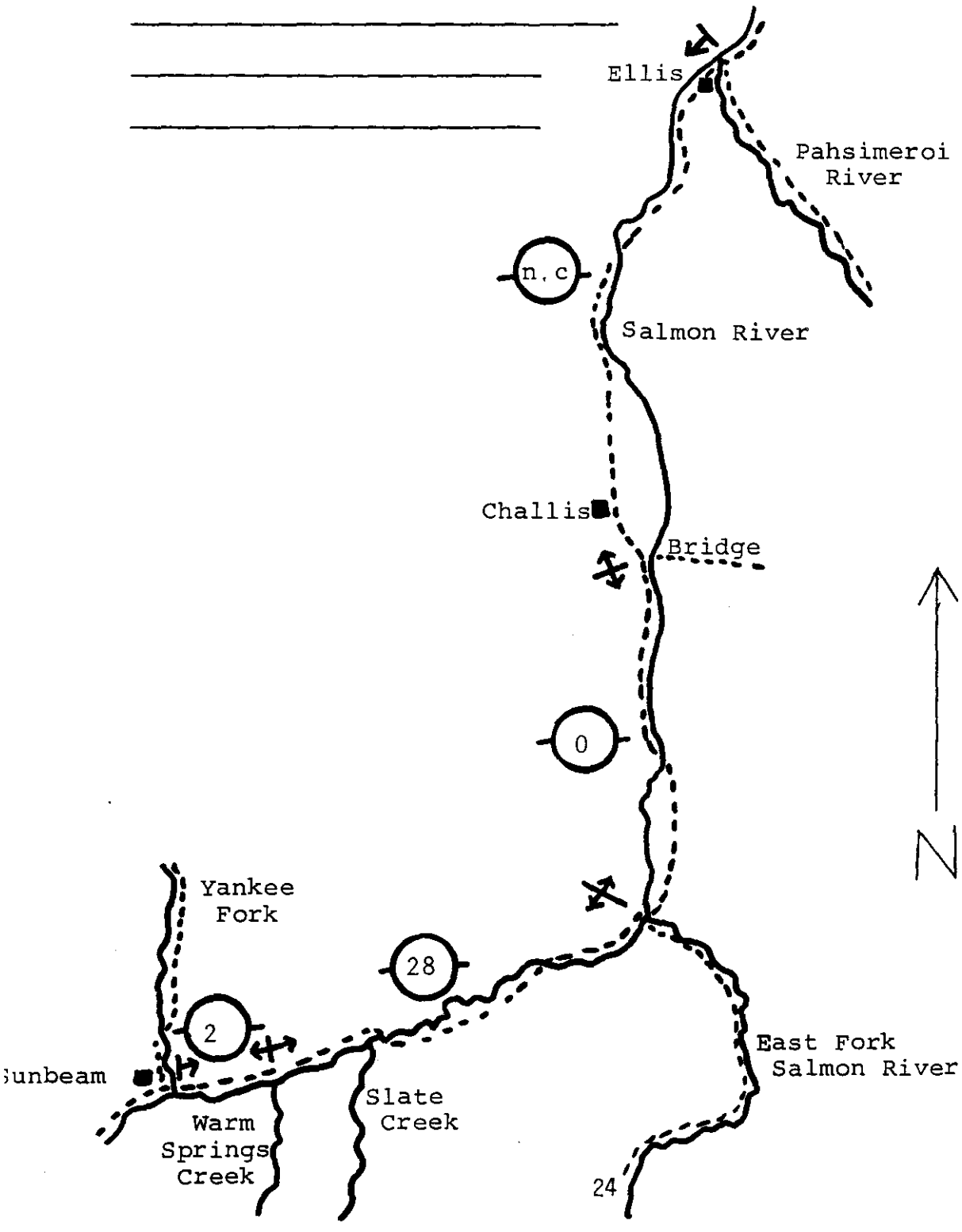
DRAINAGE Salmon River SURVEY DATE Sept. 3, 1981

STREAM Salmon River MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Kent Ball

TIMING: Early On Time Late (mark one)

REMARKS: Not counted below Challis



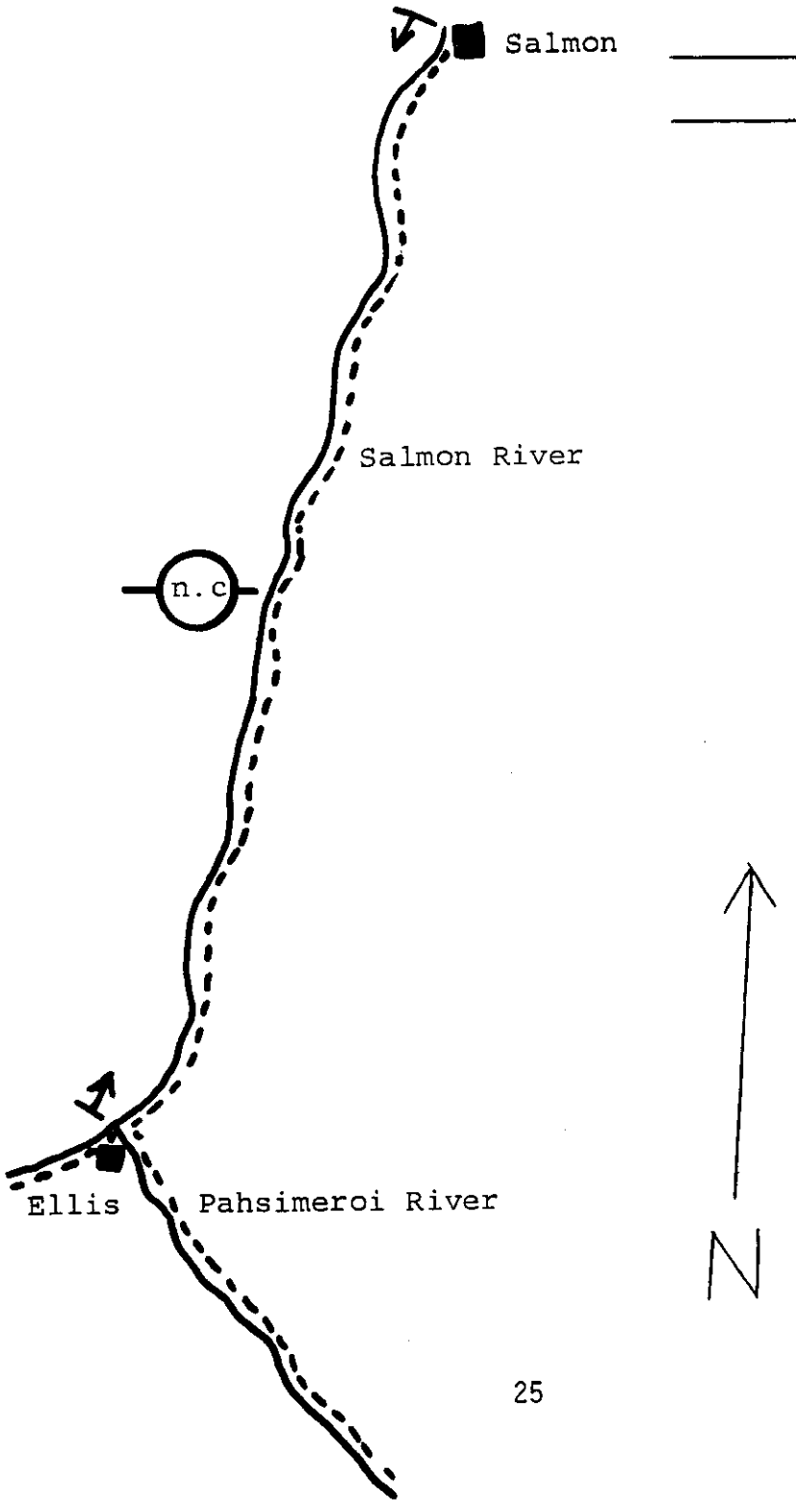
DRAINAGE Salmon River SURVEY DATE _____

STREAM Salmon River MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: _____



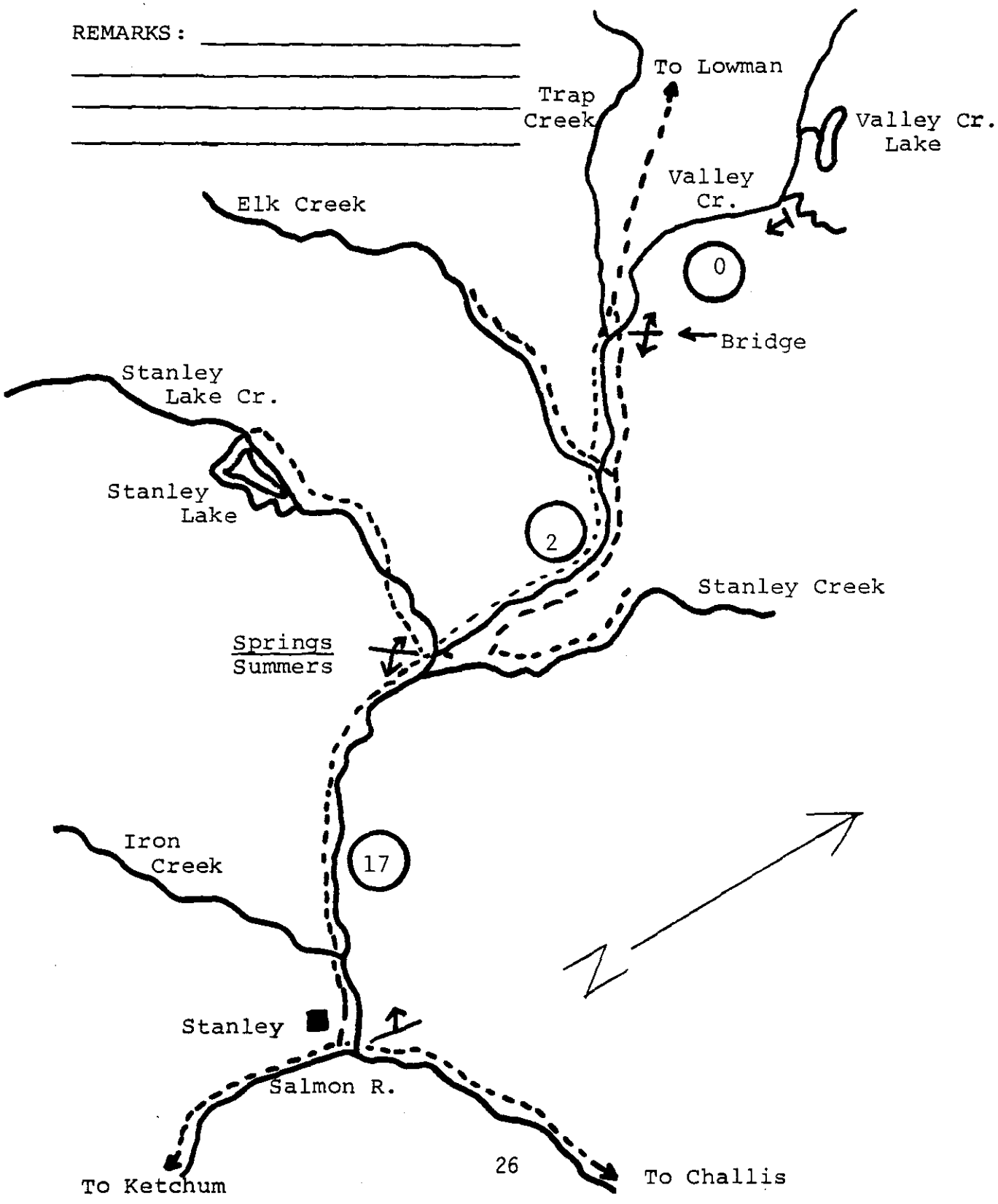
DRAINAGE Salmon River SURVEY DATE Aug. 21; Sept. 2, 1981

STREAM Valley Creek MAP SCALE 2/3" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Law, Murnane, Gadwa

TIMING: Early On Time Late (mark one)

REMARKS: _____



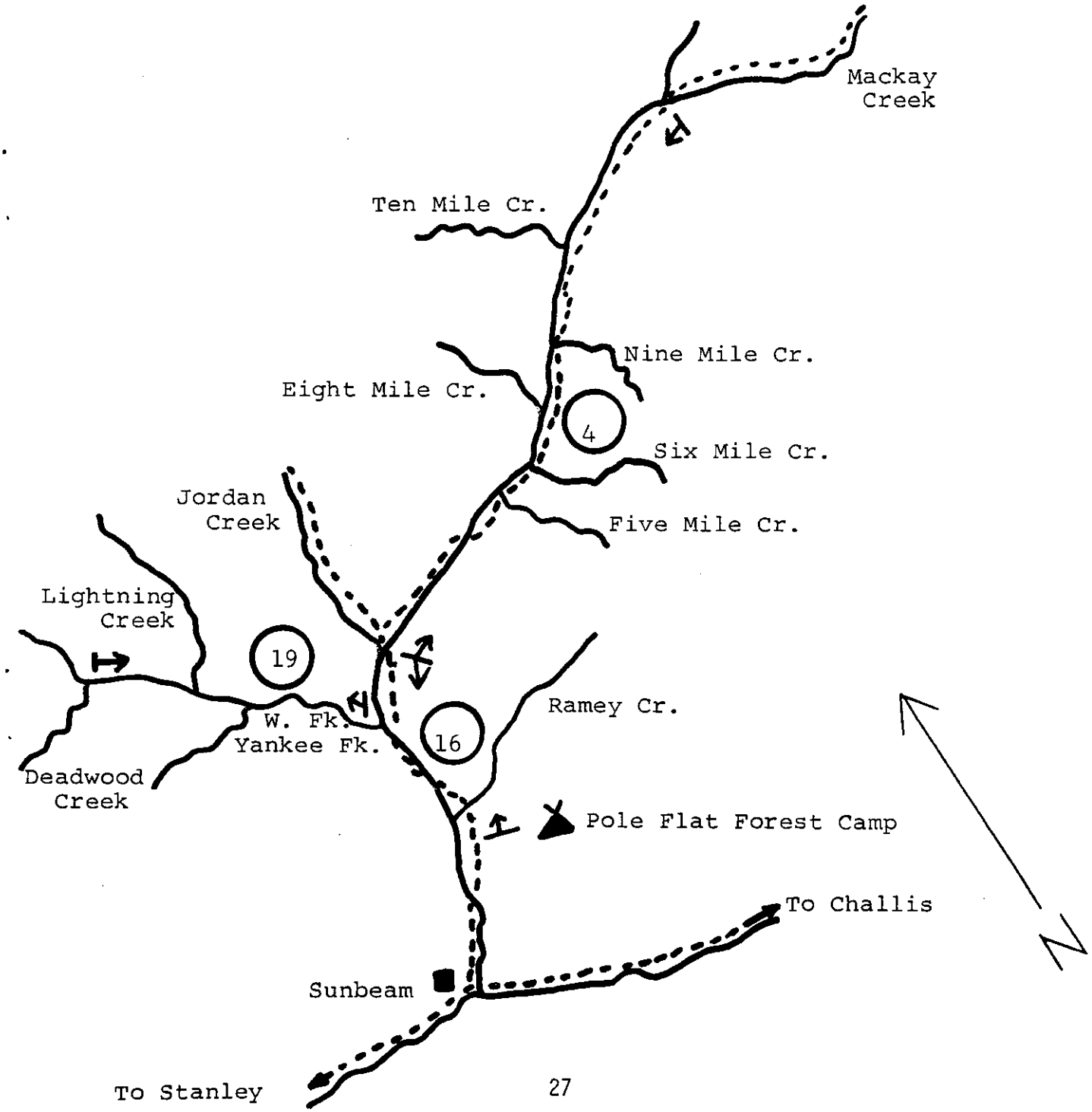
DRAINAGE Salmon River SURVEY DATE Aug. 17, 18, 24, 1981

STREAM Yankee Fork MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Gadwa, Murnane

TIMING: Early On Time Late (mark one)

REMARKS: No survey above Eightmile Creek



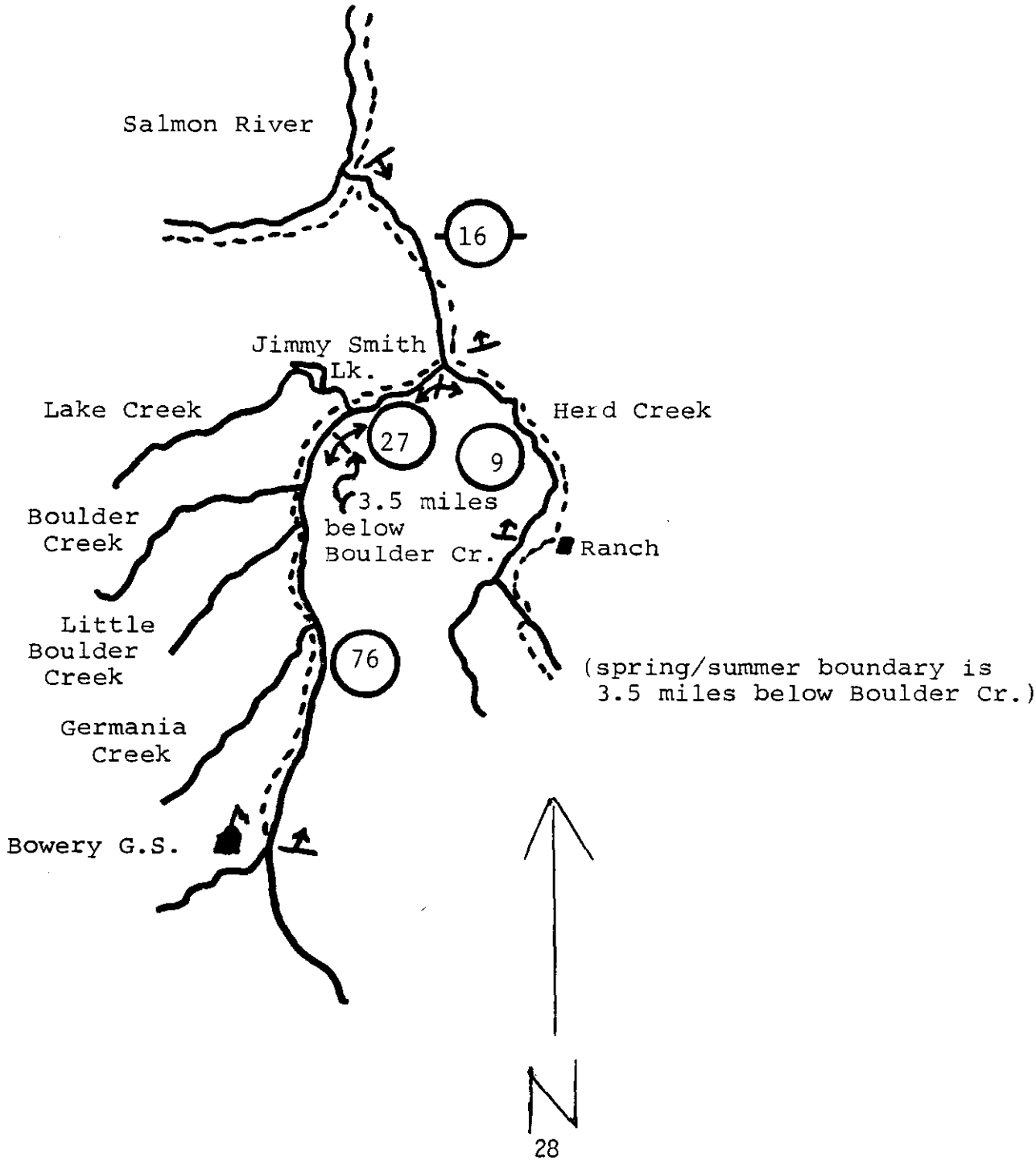
DRAINAGE Salmon River SURVEY DATE Aug. 29, Sept. 3, 1981

STREAM East Fork MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Reingold, Murnane

TIMING: Early On Time Late (mark one)

REMARKS: Section between 3.5 miles below Boulder Creek and Herd Creek was flown.



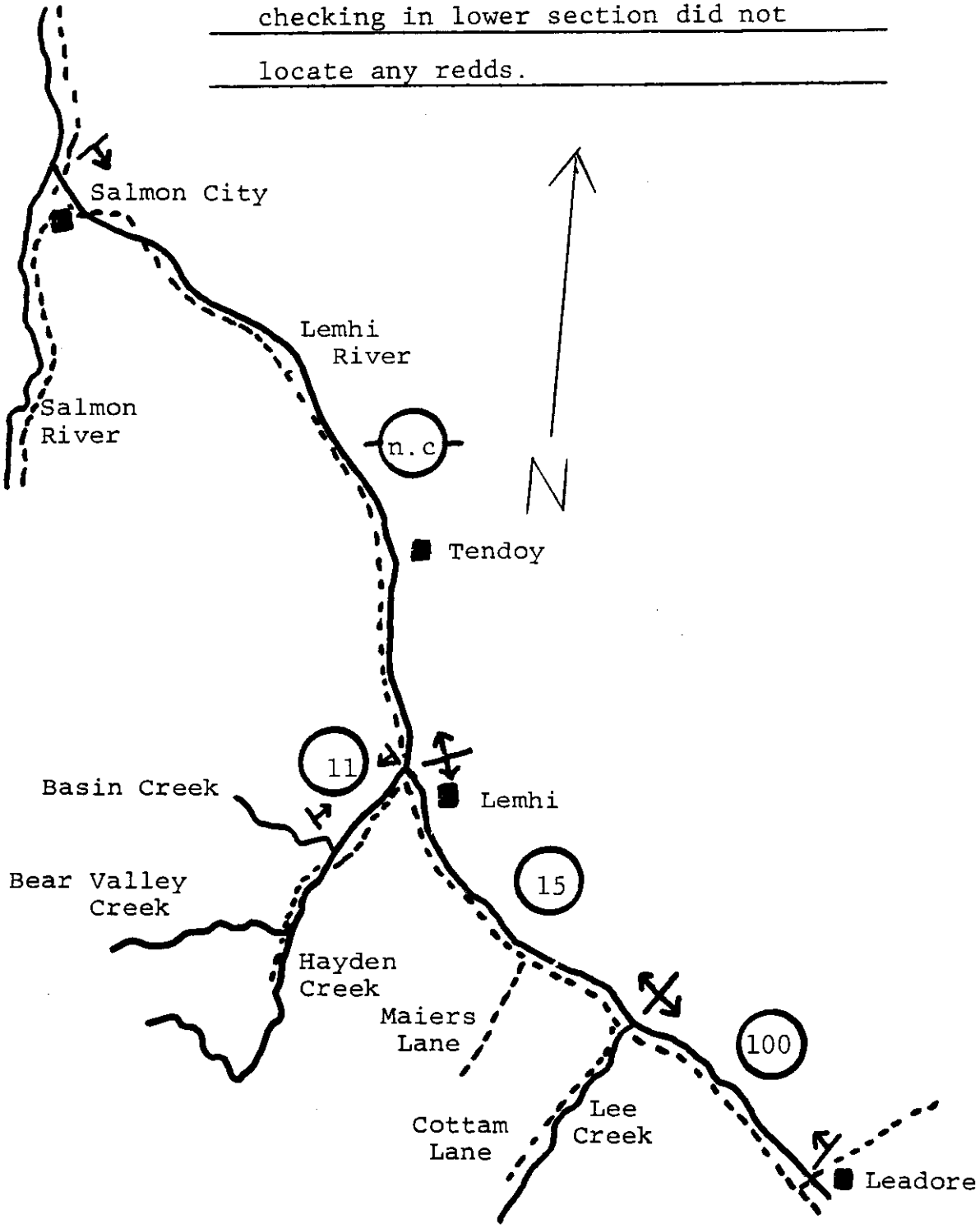
DRAINAGE Salmon River SURVEY DATE Sept. 4, 8, 1981

STREAM Lemhi River MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Murnane, Beers

TIMING: Early On Time Late (mark one)

REMARKS: Lower section was not counted. Spot checking in lower section did not locate any redds.



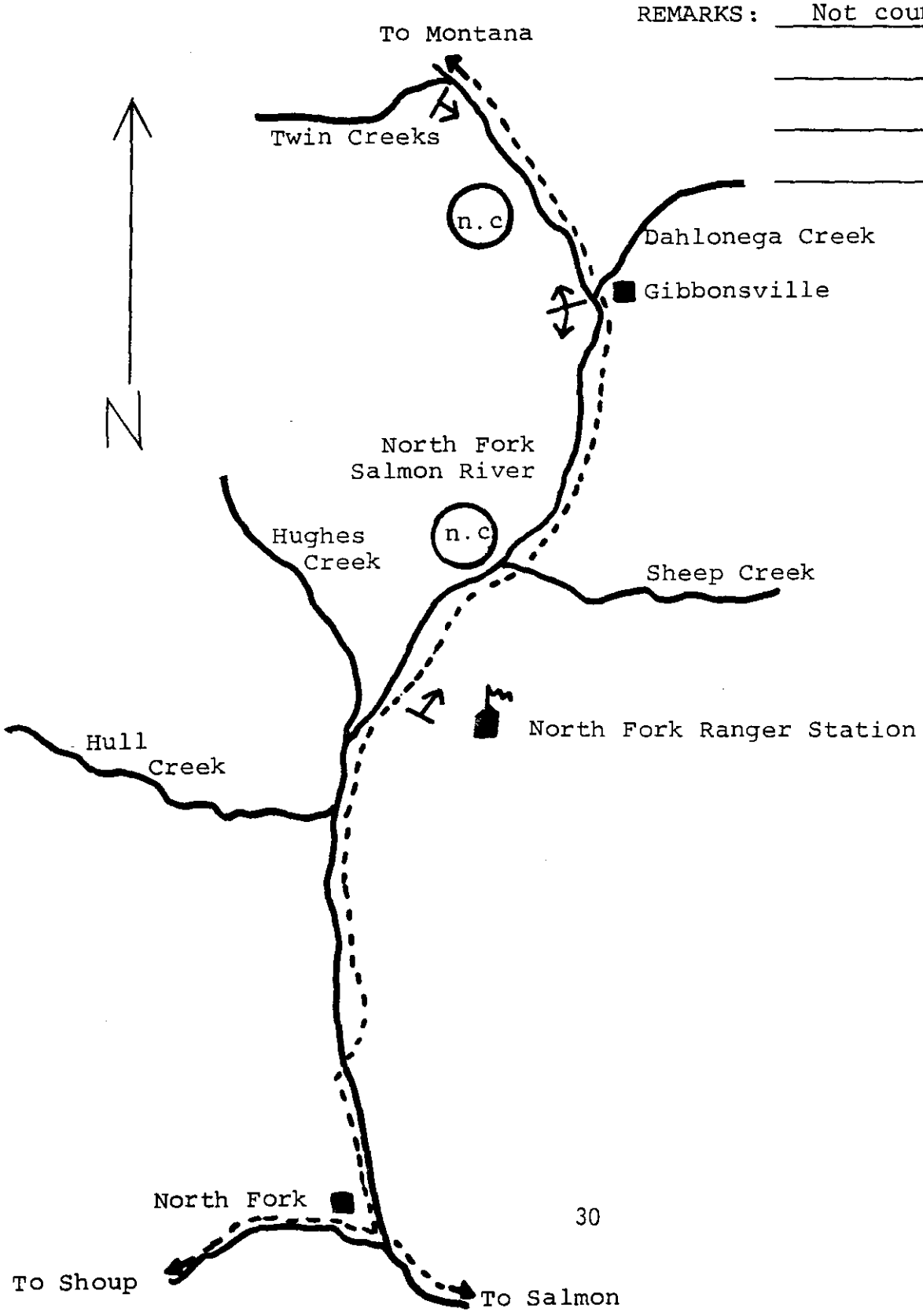
DRAINAGE Salmon River SURVEY DATE _____

STREAM North Fork MAP SCALE 1/2" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: Not counted.



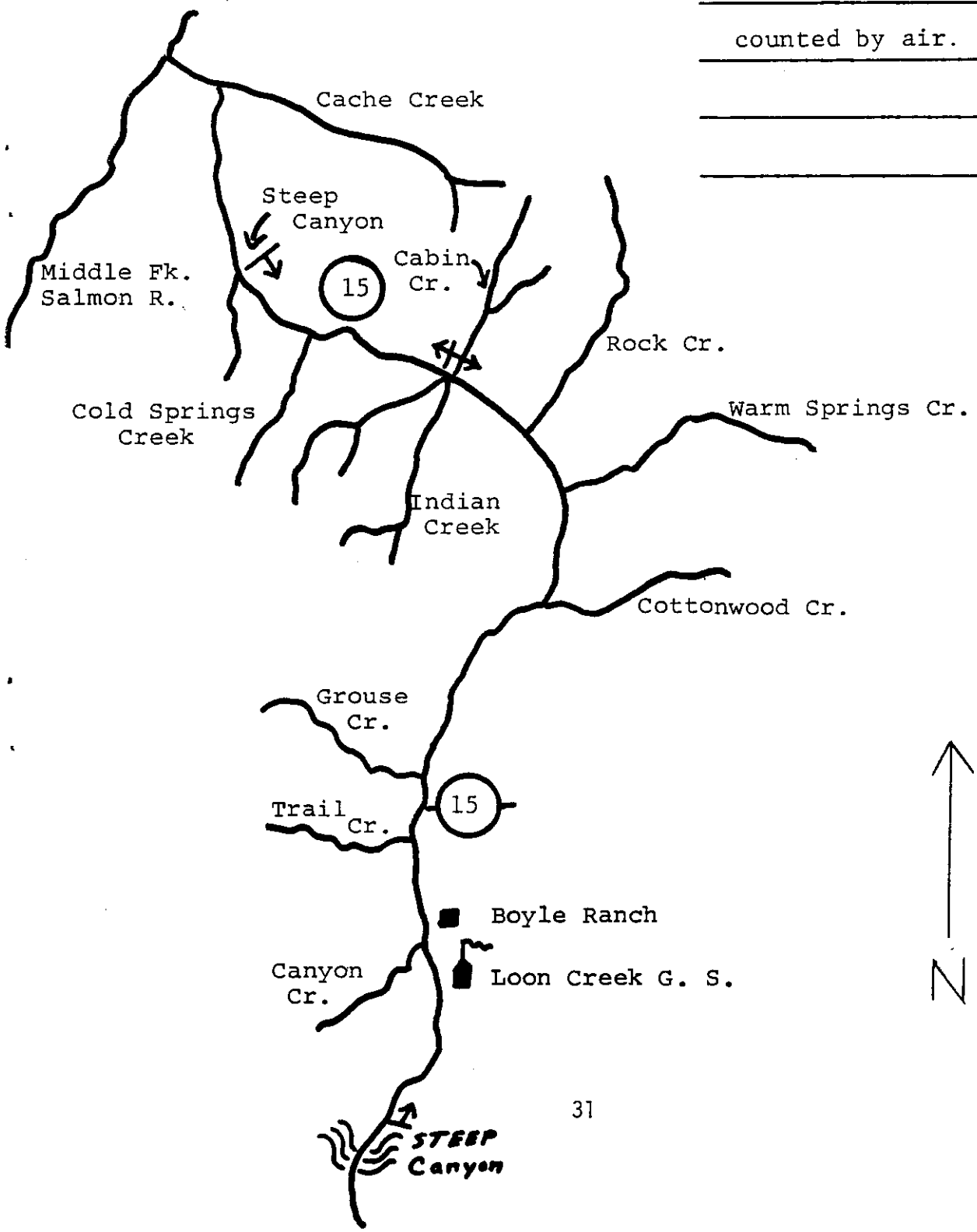
DRAINAGE Middle Fork Salmon River SURVEY DATE Aug. 24, Sept. 4, 1981

STREAM Loon Creek MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball

TIMING: Early On Time Late (mark one)

REMARKS: Both sections were counted by air.



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